

AD-A152 157

A REVIEW OF SNOW CONDITIONS AND WINTER CLIMATE NEAR
BURLINGTON AND UNDERHILL VERMONT(1) COLD REGIONS
RESEARCH AND ENGINEERING LAB HANOVER NH M A BILELLO

1/1

UNCLASSIFIED

JAN 80 CRREL-IR-618

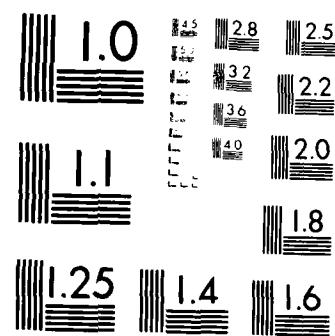
F/G 4/2

NL

END

FILED

100



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1964

Internal Report 618

1

January 1980

AD-A152 157

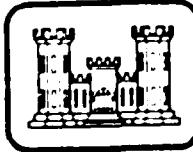
A REVIEW OF SNOW CONDITIONS AND WINTER CLIMATE NEAR BURLINGTON AND UNDERHILL, VT

Michael A. Bilello

DTIC FILE COPY

This document has been approved
for public release and makes its
distribution is unlimited.

DTIC
SELECTED
APR 08 1985
S E D



UNITED STATES ARMY
CORPS OF ENGINEERS
COLD REGIONS RESEARCH AND ENGINEERING LABORATORY
HANOVER, NEW HAMPSHIRE, USA



A REVIEW OF SNOW CONDITIONS
AND WINTER CLIMATE NEAR BURLINGTON
AND UNDERHILL, VT*

Michael A. Bilello
Meteorologist
USA CRREL
Hanover, NH

Approved For	
Michael Bilello	<input checked="" type="checkbox"/>
Dist. Rep.	<input type="checkbox"/>
User's Name	<input type="checkbox"/>
Distribution	
By _____	
Distribution/ _____	
Availability Codes	
Dist	Avail and/or Special
A-1	



- * The material included in this review was presented at a "Snow I" briefing held at USA CRREL on 10 October 1979.

SUMMARY

This review provides information on the winter environment near Camp Ethan Allen in northwestern Vermont. In particular, monthly summaries of the frequency, intensity, and water content of snowfall events are presented. Additional information on air-temperature, wind and snow depth for the region is also provided.

The data for this summary were obtained from: a) daily snow cover and weather observations made at the Proctor Maple Research Farm at Underhill, Vermont, and b) hourly meteorological measurements made at Burlington Airport, Vermont.

The Underhill site is a field research station operated by the Botany Department of the University of Vermont under the direction of Professors M. F. Morselli and F. M. Laing. Twelve years (1967-1979) of snowfall and snow depth data were provided by Lynn Whalen of the Botany Department. The climate summaries for Burlington Airport are published by the U.S. National Weather Service, National Oceanic and Atmospheric Administration, Asheville, North Carolina.

This review includes:

Figure 1: A map showing the three main locations under discussion: Burlington Airport, Proctor Maple Research Farm (PMRF), and Camp Ethan Allen Training site (CEAT), the proposed field area for Snow I.

Figures 2-4: Snowfall frequencies and snow cover conditions observed at PMRF.

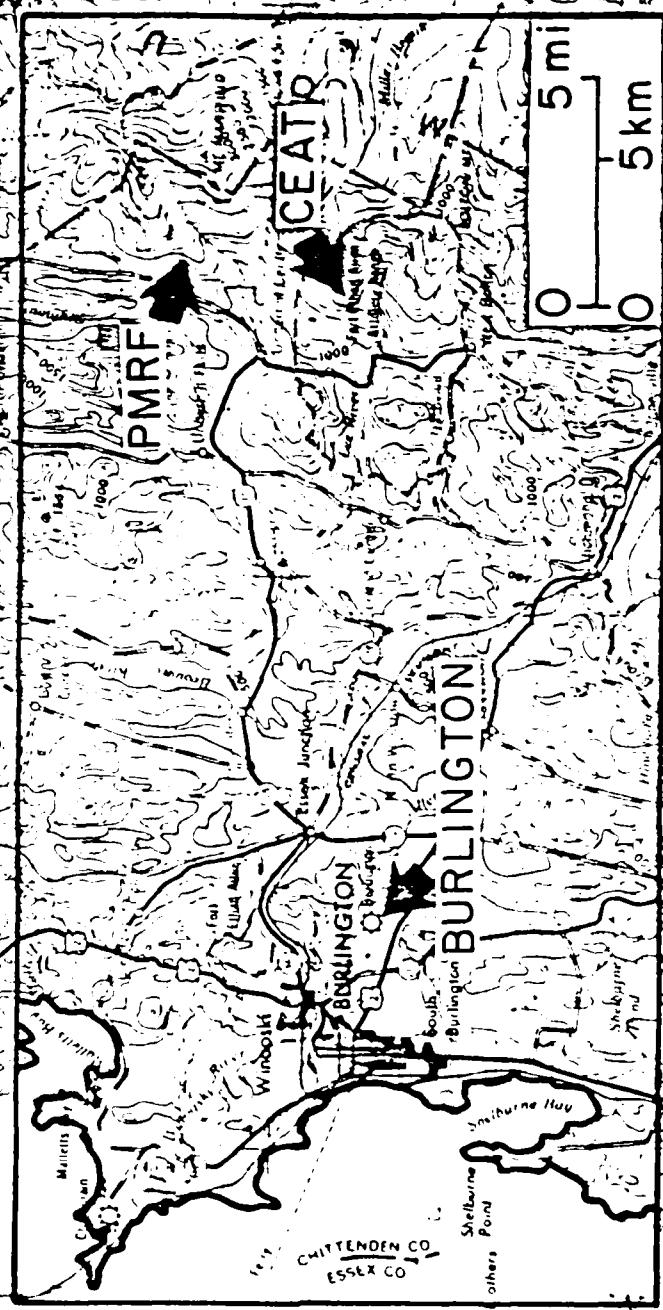
Figures 5-7: Comparisons of weather and snow conditions observed at Burlington Airport and PMRF during January 1979.

Figure 8 and 9: A summary of snowfall amounts and winter temperatures at Burlington Airport.

Figures 10-13: An analysis of snowfall amounts, corresponding water equivalents and concurrent air-temperatures for snowstorms at Burlington Airport during January 1979.

Figures 14a-d: Published Local Climatological Data for Burlington Airport. Some of this information is in the preceding diagrams; these figures provide considerably more detail.

Since the diagrams are mostly self-explanatory, no attempt will be made to discuss them in detail.



PMRF

ICEAT

BURLINGTON

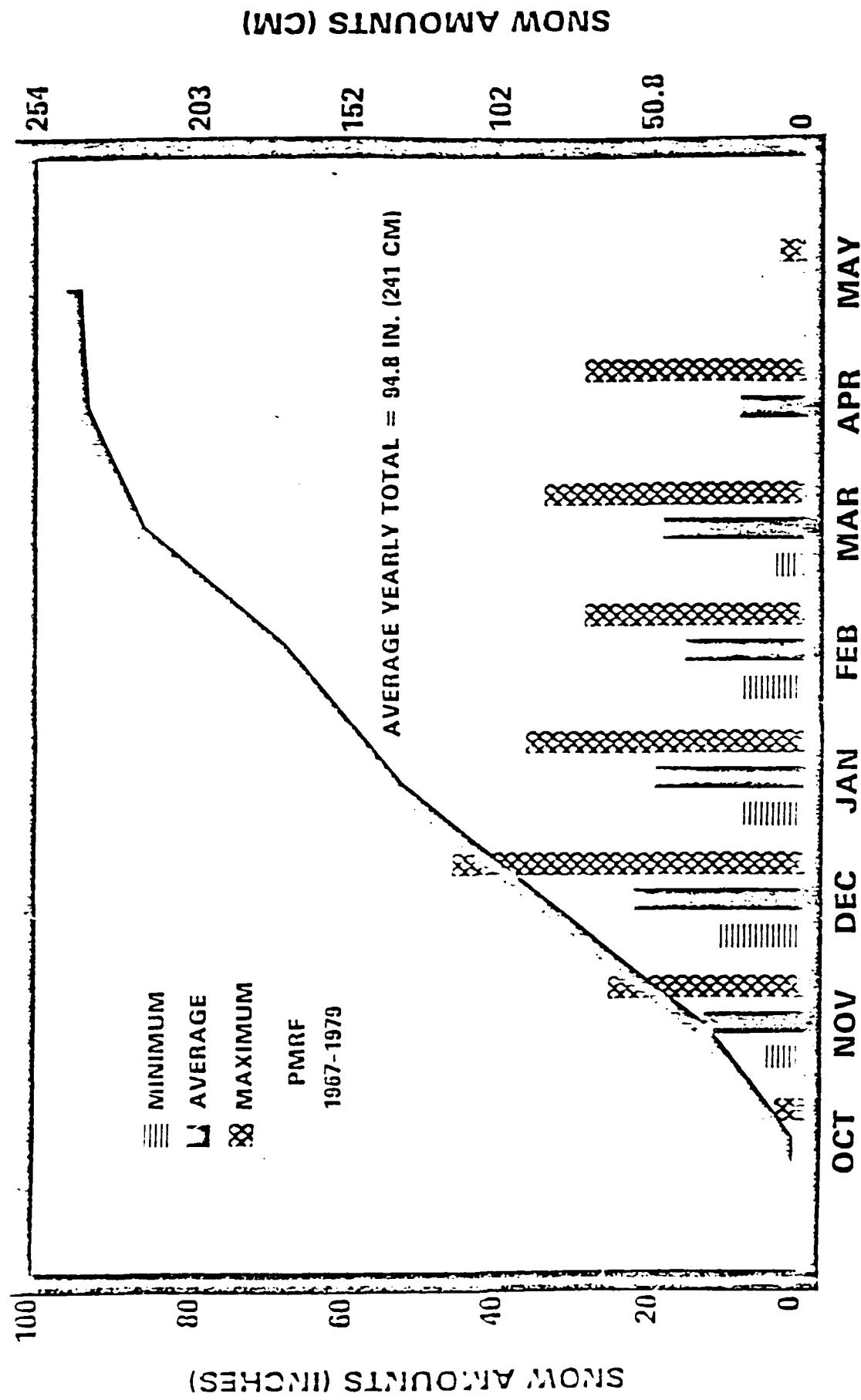
BURLINGTON

VERMONT

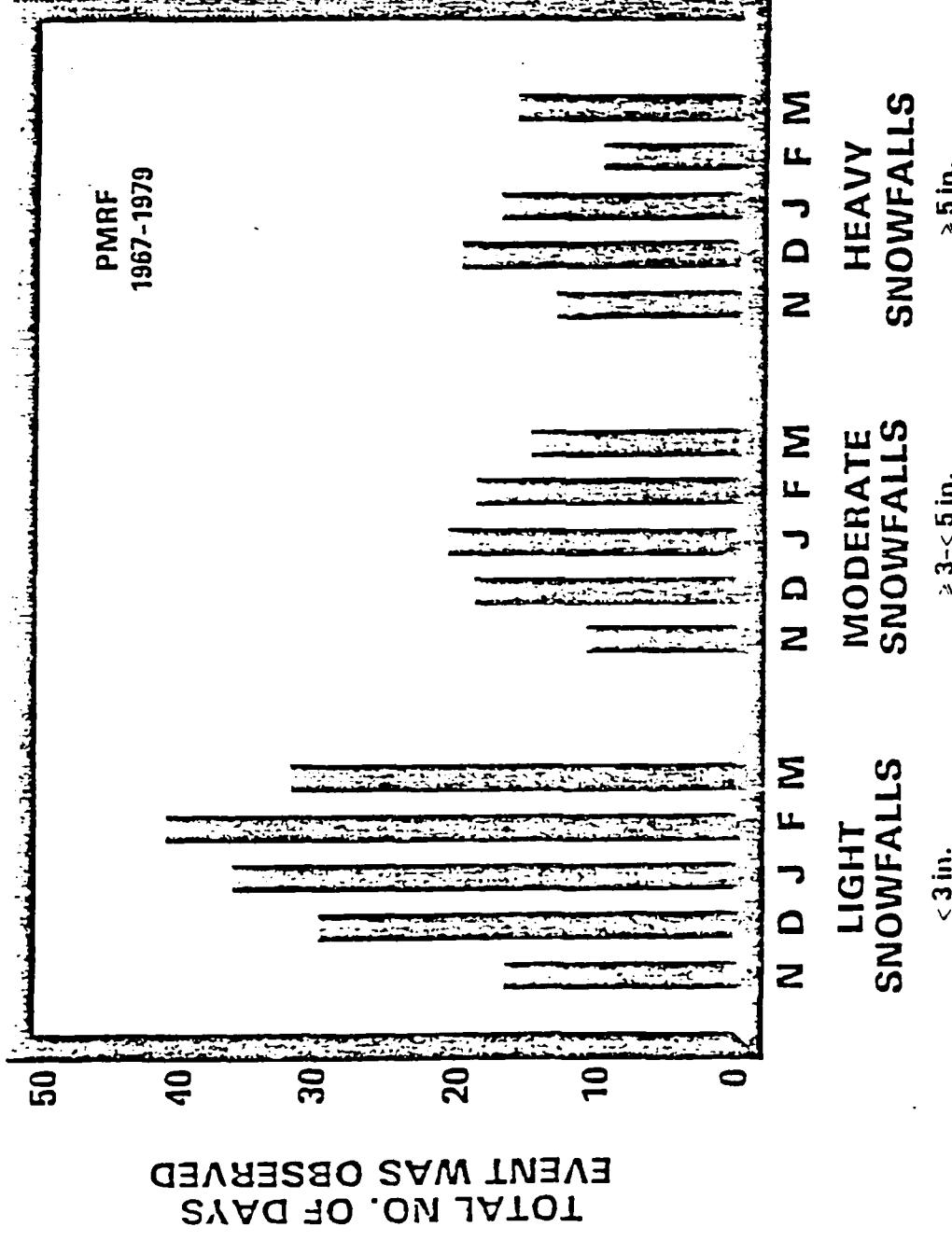
CHITTENDEN CO
ESSEX CO

F-1

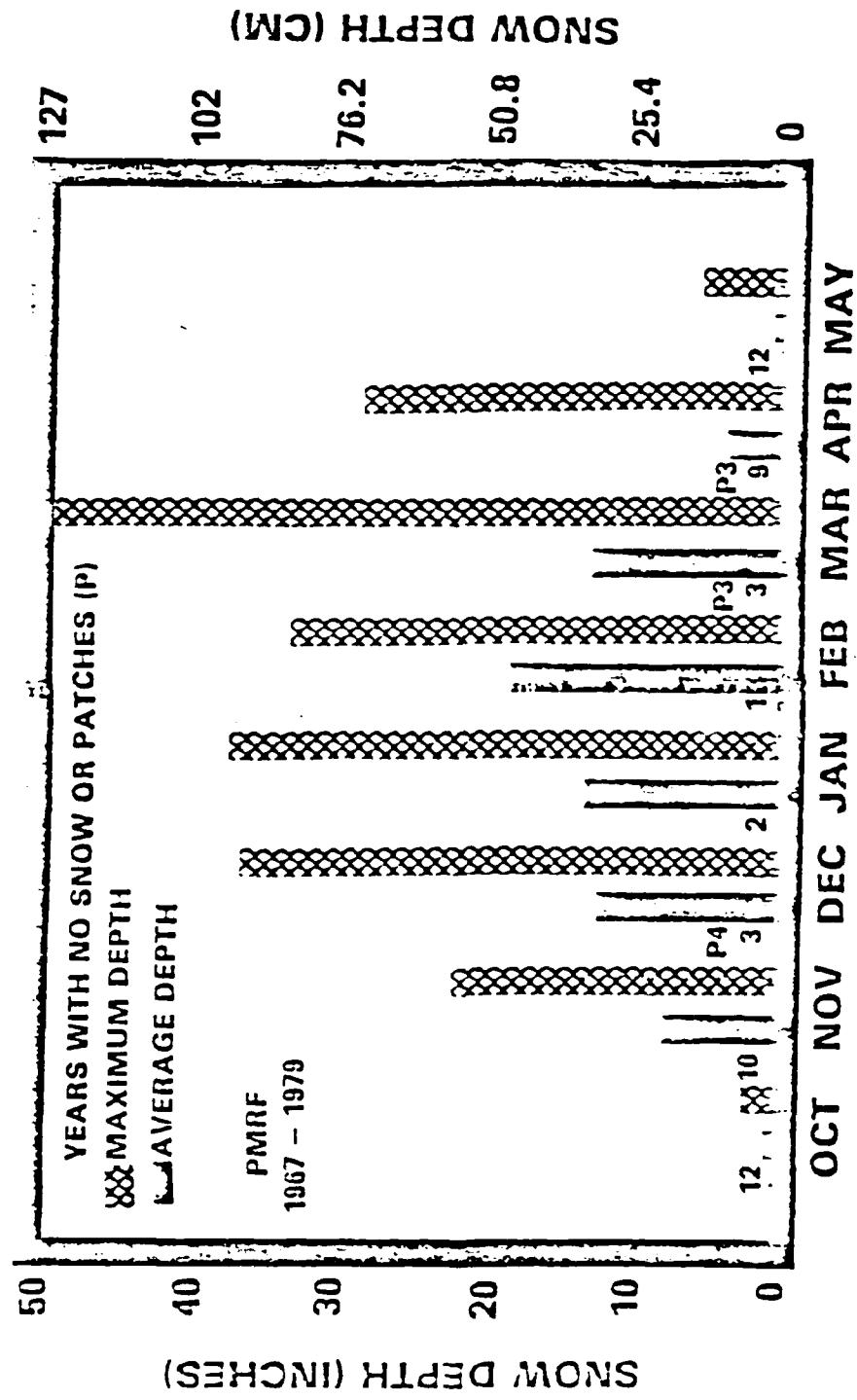
CAMP LA



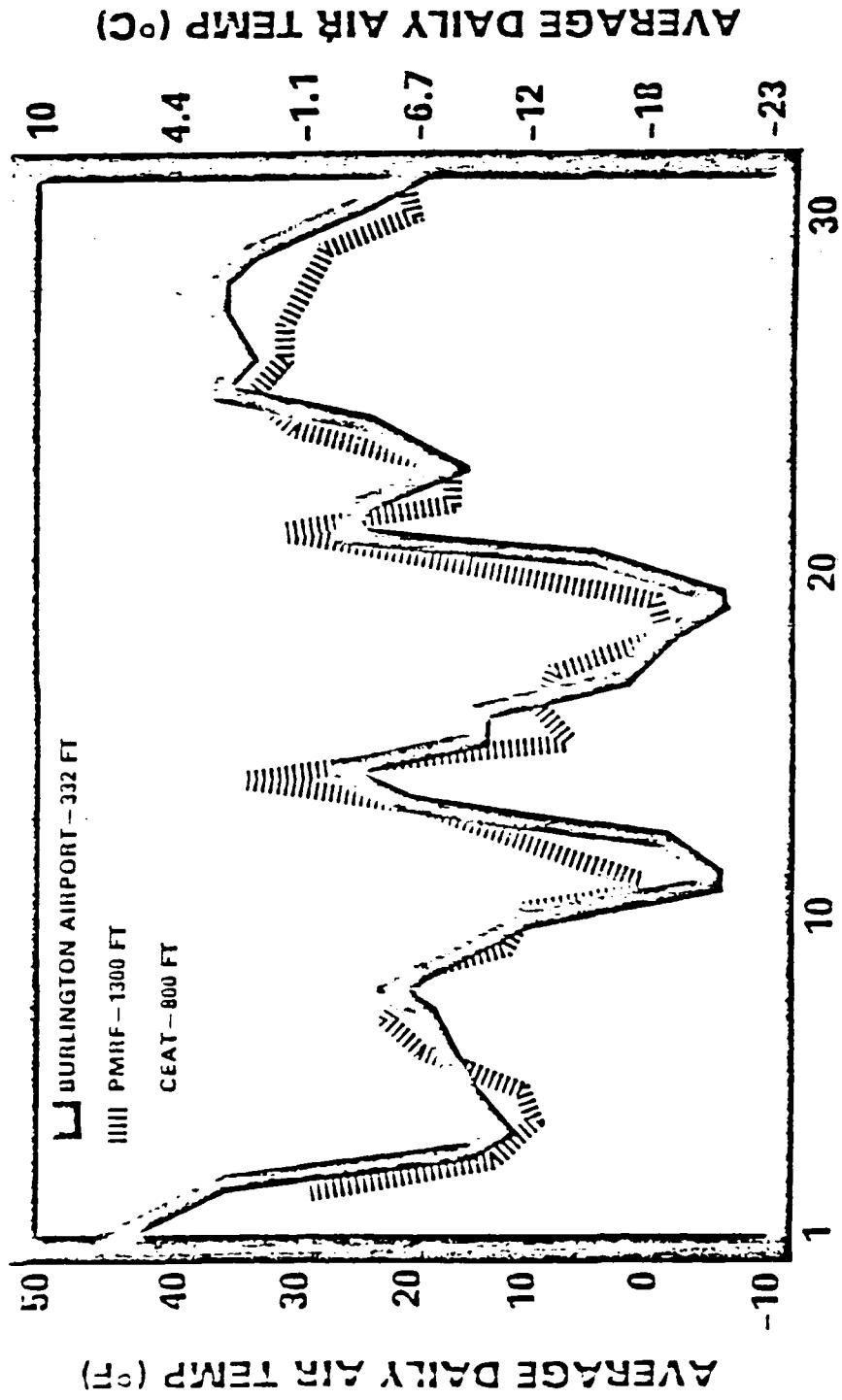
Observed Increases in Monthly Snowfall Amounts
Proctor Maple Research Farm; Underhill, Vt.
October 1967 through May 1979



Total Number of Days over a 12 Year Record that Light, Moderate and Heavy Snowfalls were Observed; PMRF; 4a Jorkill, Vt.
Nov 1967 - March 1979



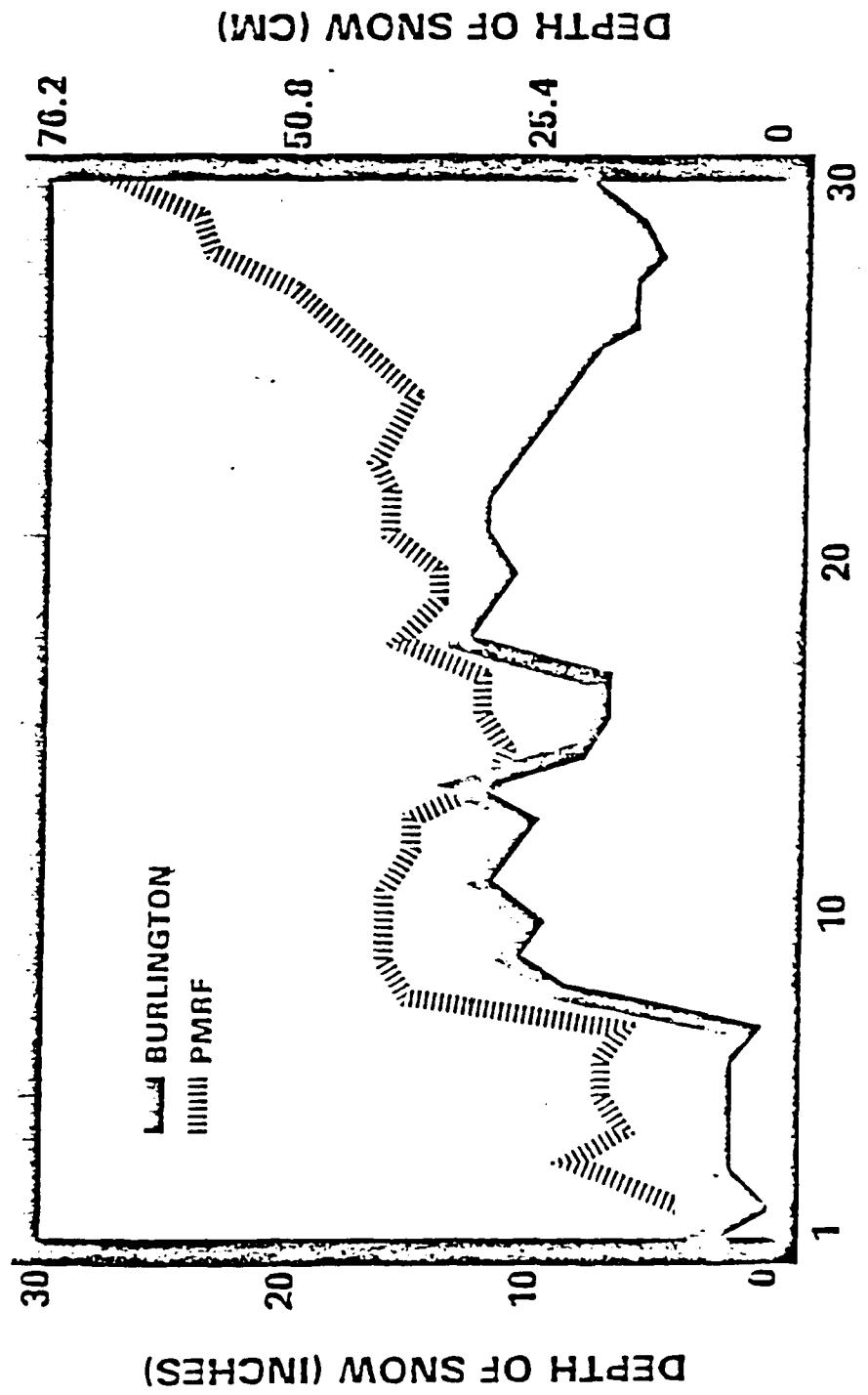
Observed Depth of Snow on the Ground
PMRF; Underhill, Vt. Oct. 1967 - May 1979



JANUARY 79

Present weather	R	R	S	F	S	S	S	S	S	R	S	S	R	S	S	S	S	S	S	R	S	S	Burlington
-	R	S	S	S	S	S	S	S	S	R	S	S	F	S	S	S	S	S	S	F	S	S	PMRF
Date -	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	29	31	33	35

Comparison of Observed Air Temperatures and Weather Conditions between Burlington and PNRF during Jan. 1979

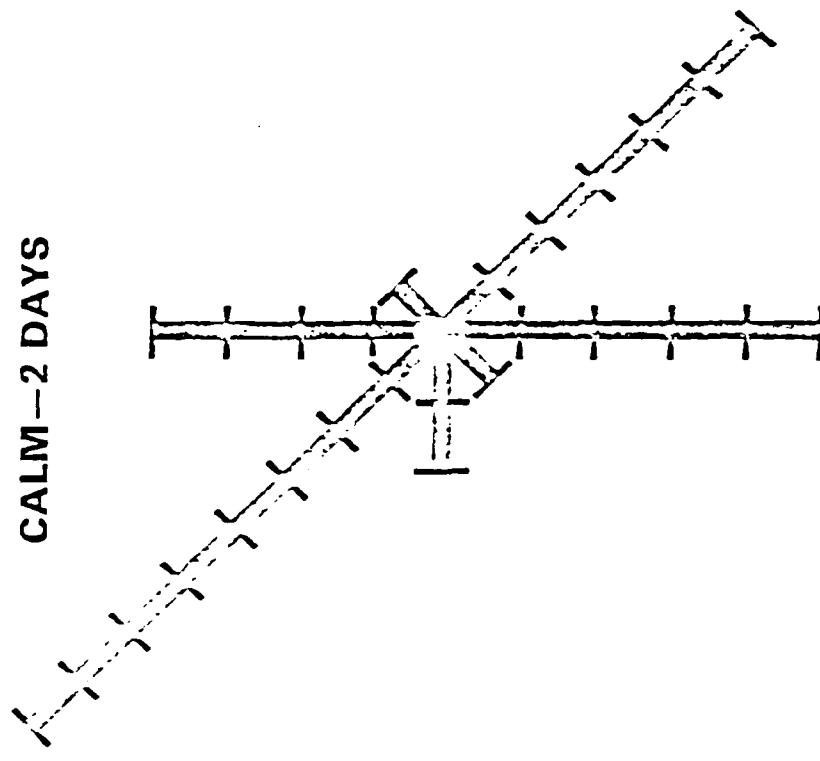


Comparison of Daily Variations in Snow Depths
between Burlington and PMRF, Jan. 1979

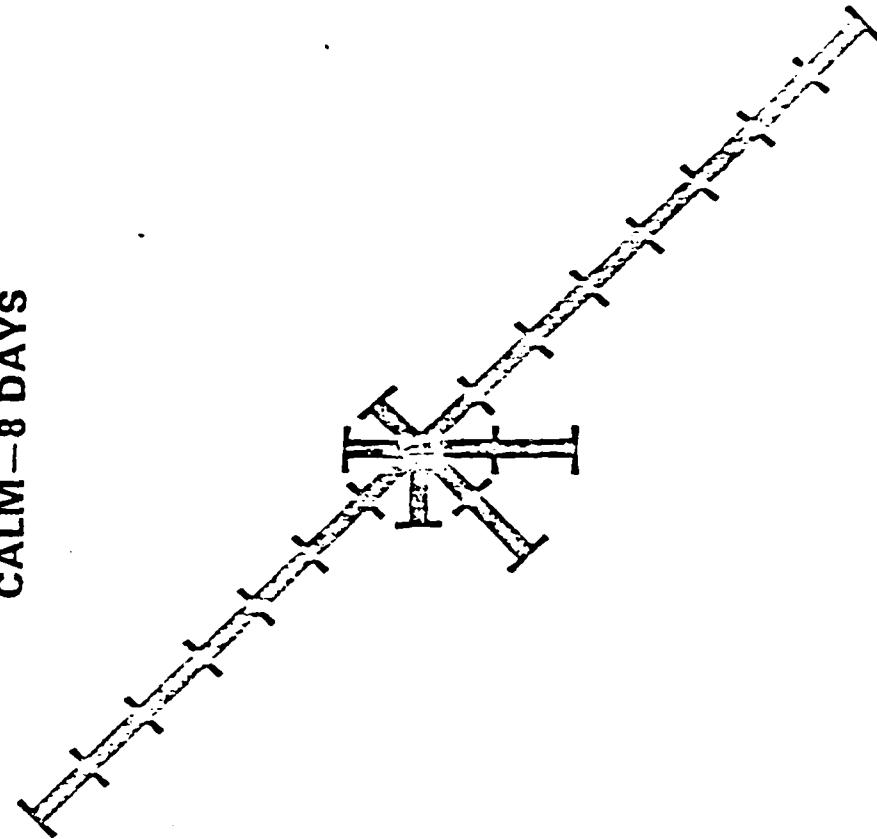
F. C



BURLINGTON, VT.
CALM - 2 DAYS



PMRF
CALM - 8 DAYS



Avg. Wind Speed: 9.5 MPH (4.25 MPS)

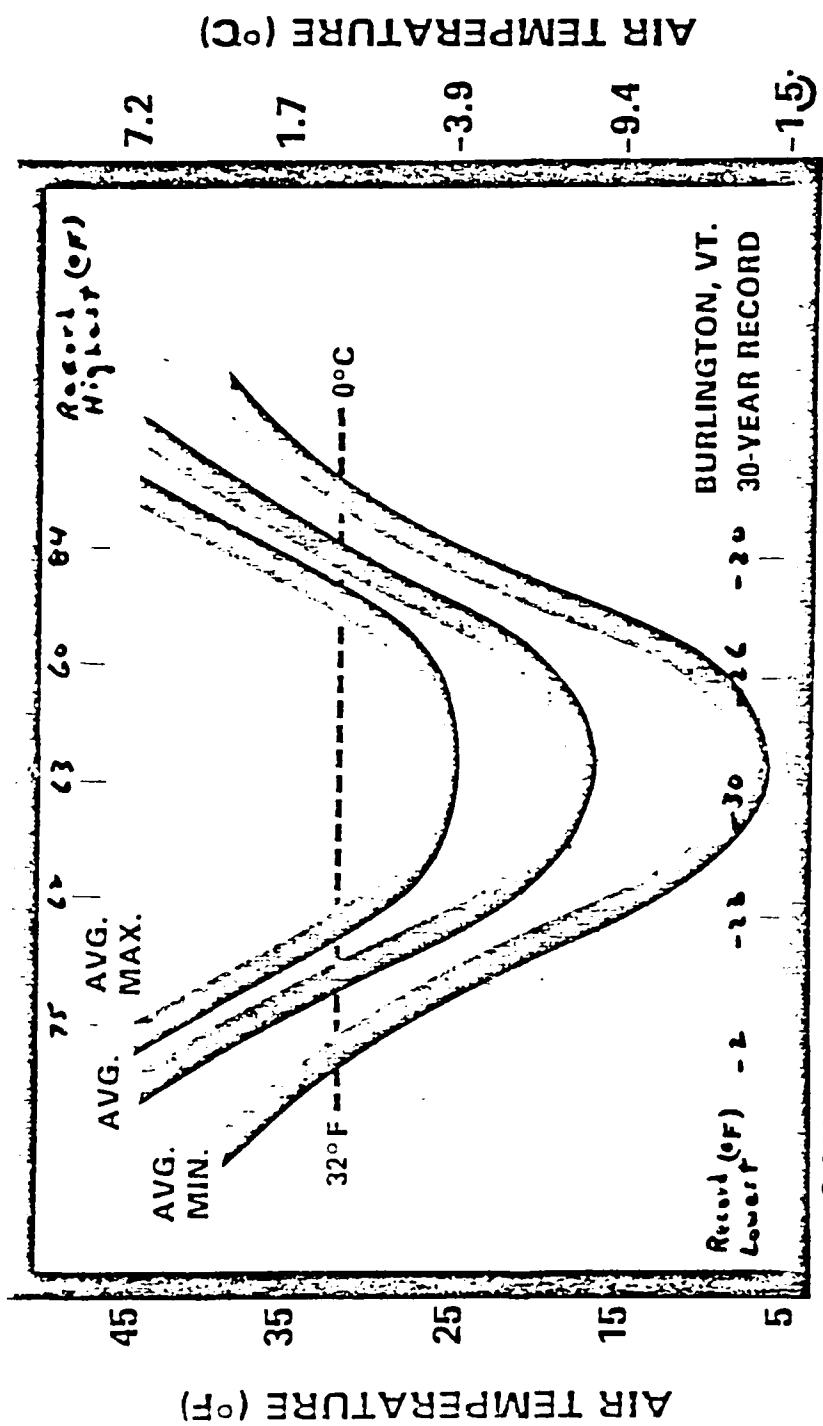
Avg. Daily Wind Directions
January 1979

F-7

Avg. Wind Speed: 4.1 MPH (1.83 MPS)

Average winter Air Temperatures
Burlington, Vt.

OCT NOV DEC JAN FEB MAR APR MAY



SNOWFALL AMOUNTS (CM)

152

102

50.8

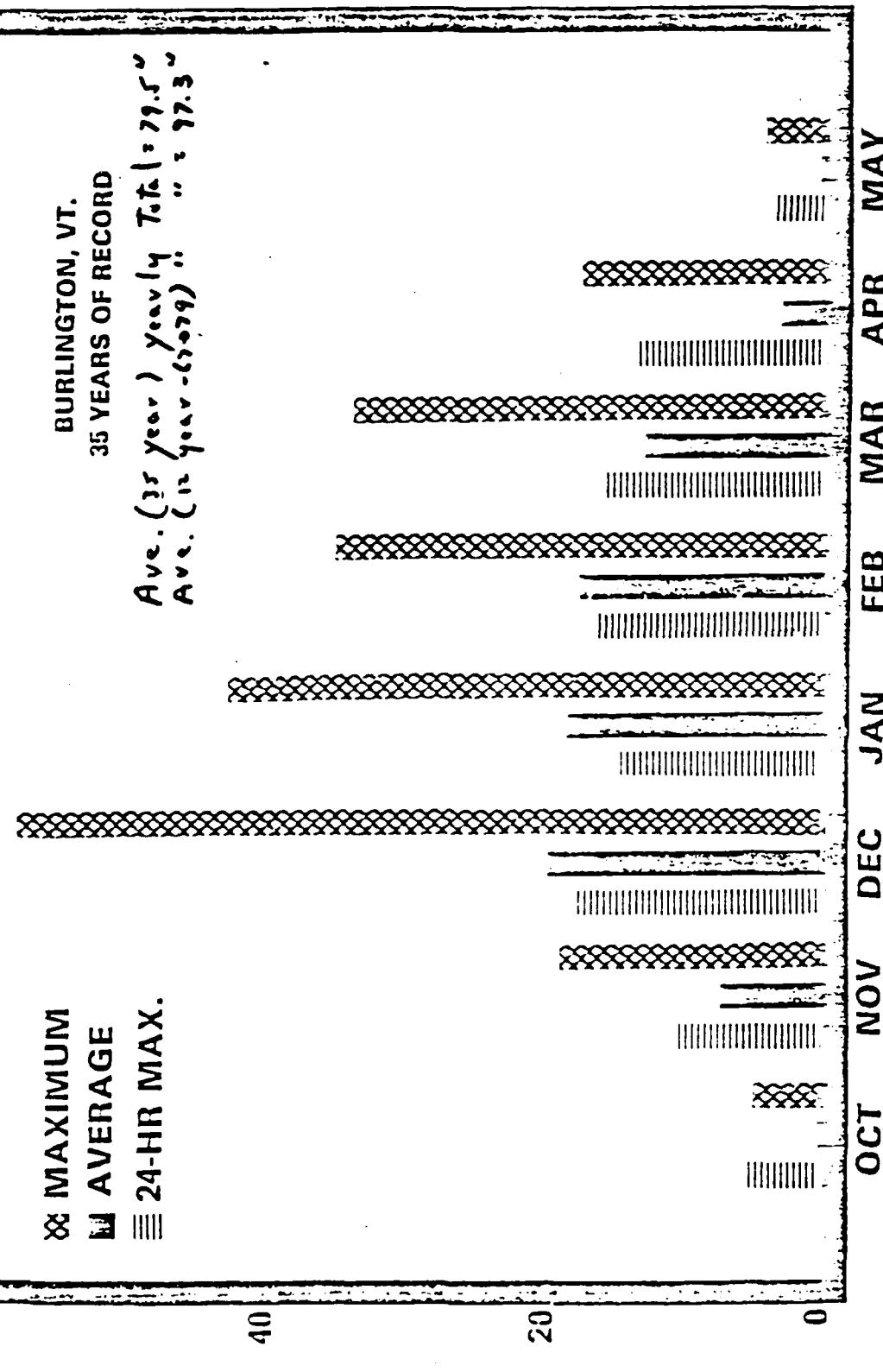
0

☒ MAXIMUM
 □ AVERAGE
 ≡ 24-HR MAX.

BURLINGTON, VT.

35 YEARS OF RECORD

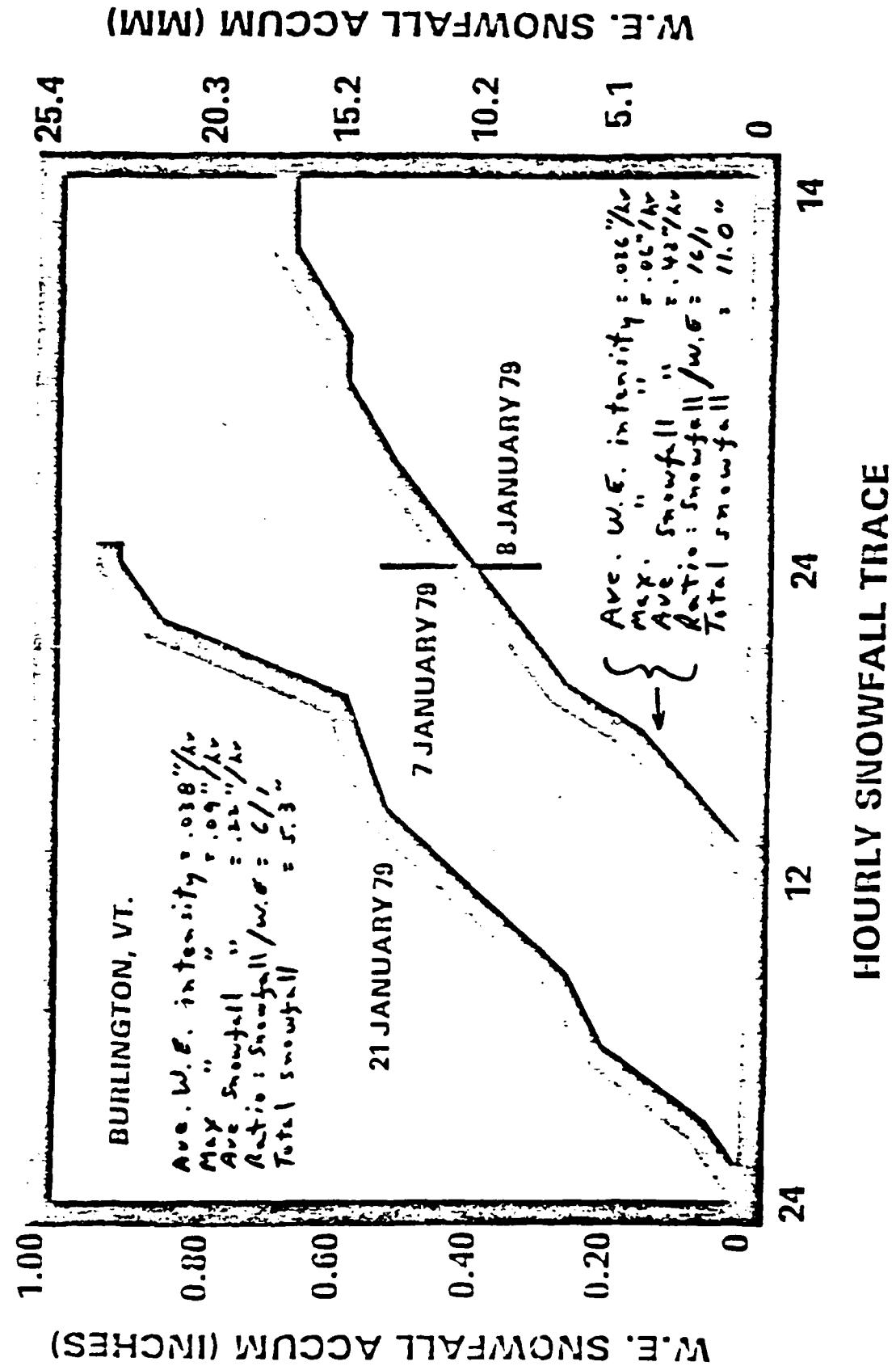
Ave. (1st year) Yearly Total = 71.5"
 Ave. (in years 1900-1939) " " = 77.3"



SNOWFALL AMOUNTS (INCHES)

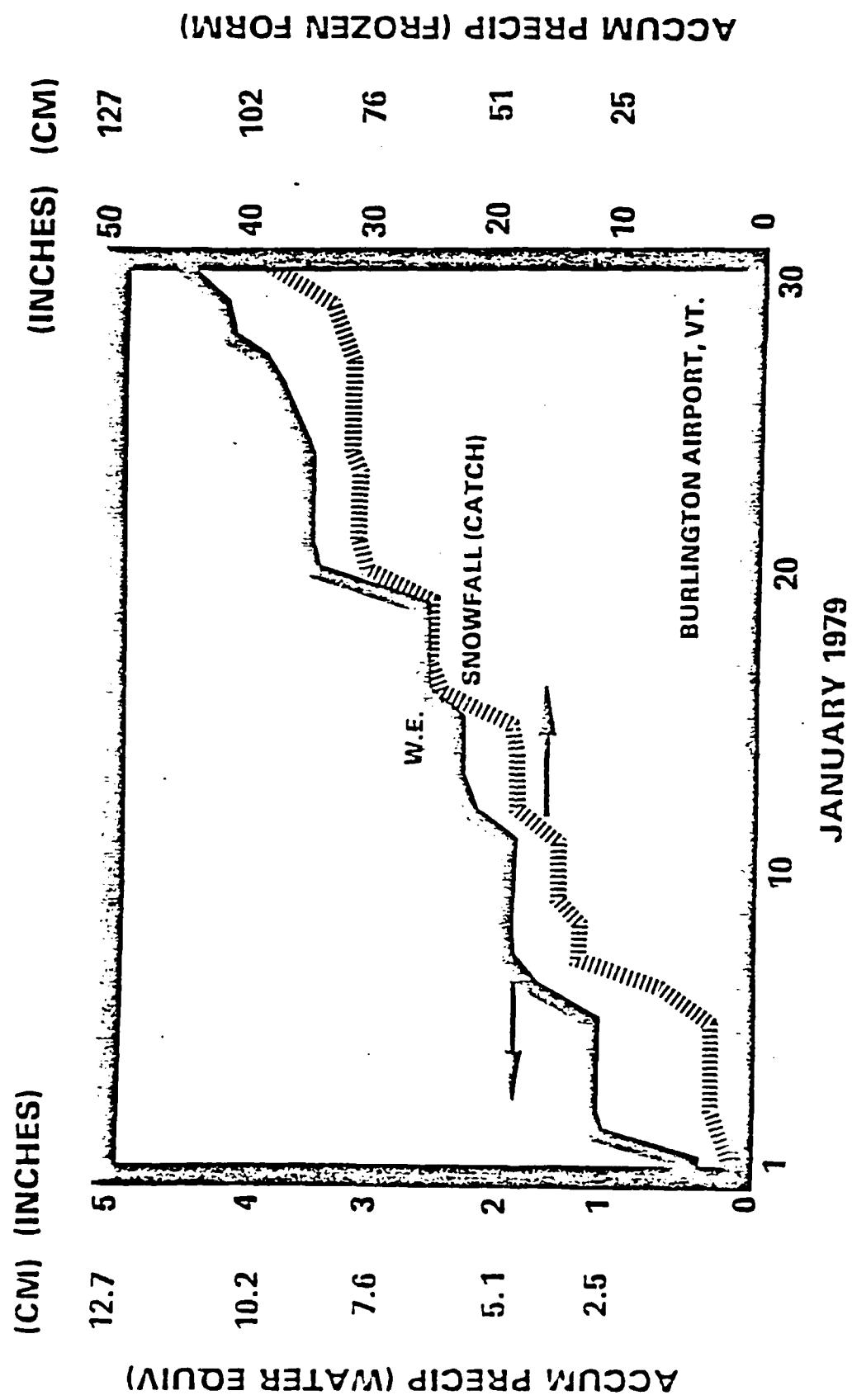
Observed Snowfall Amounts, Burlington, Vt.

F-9

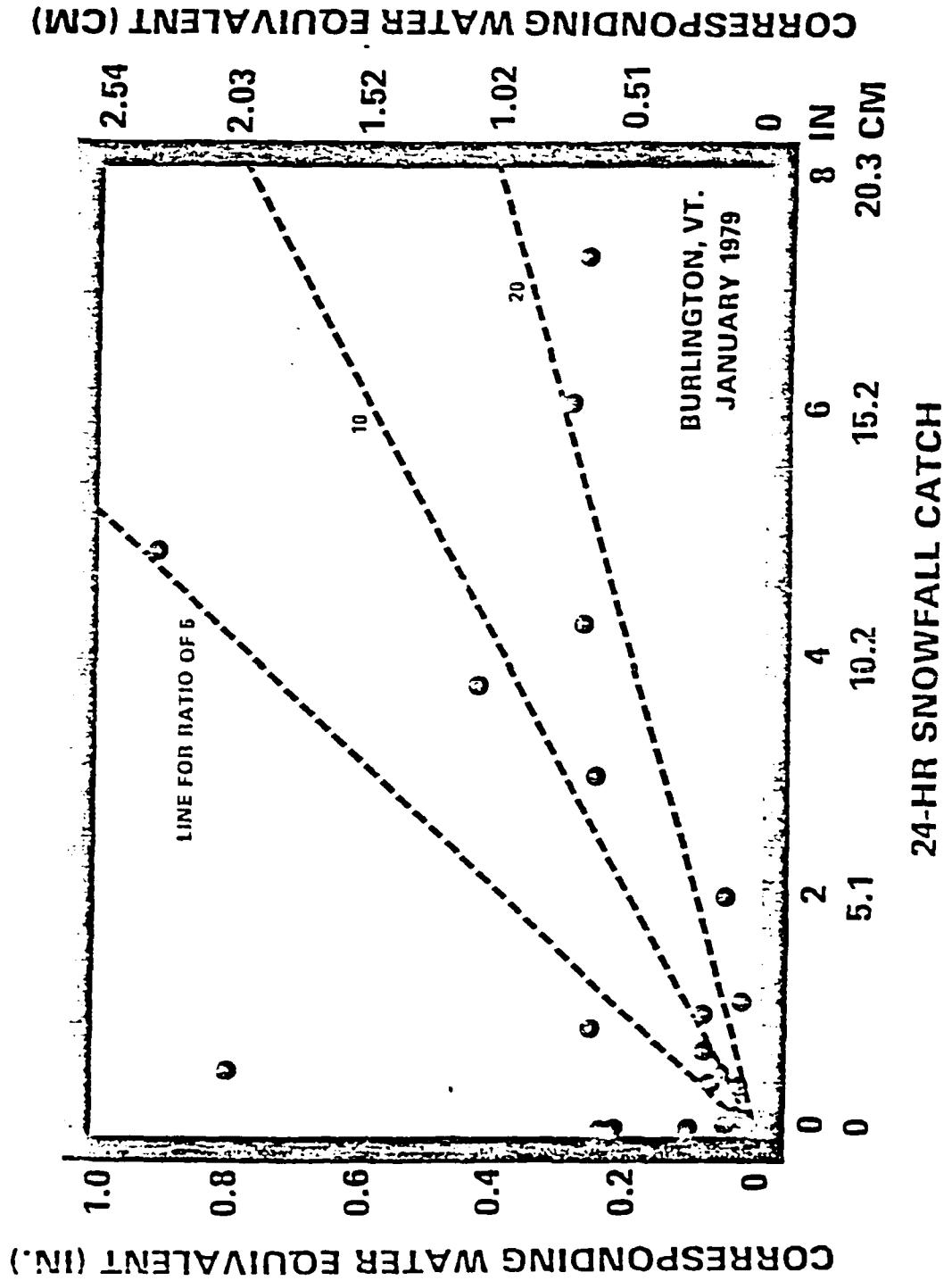


HOURLY SNOWFALL TRACE

Analysis of Two snowstorms at Burlington
January 1979

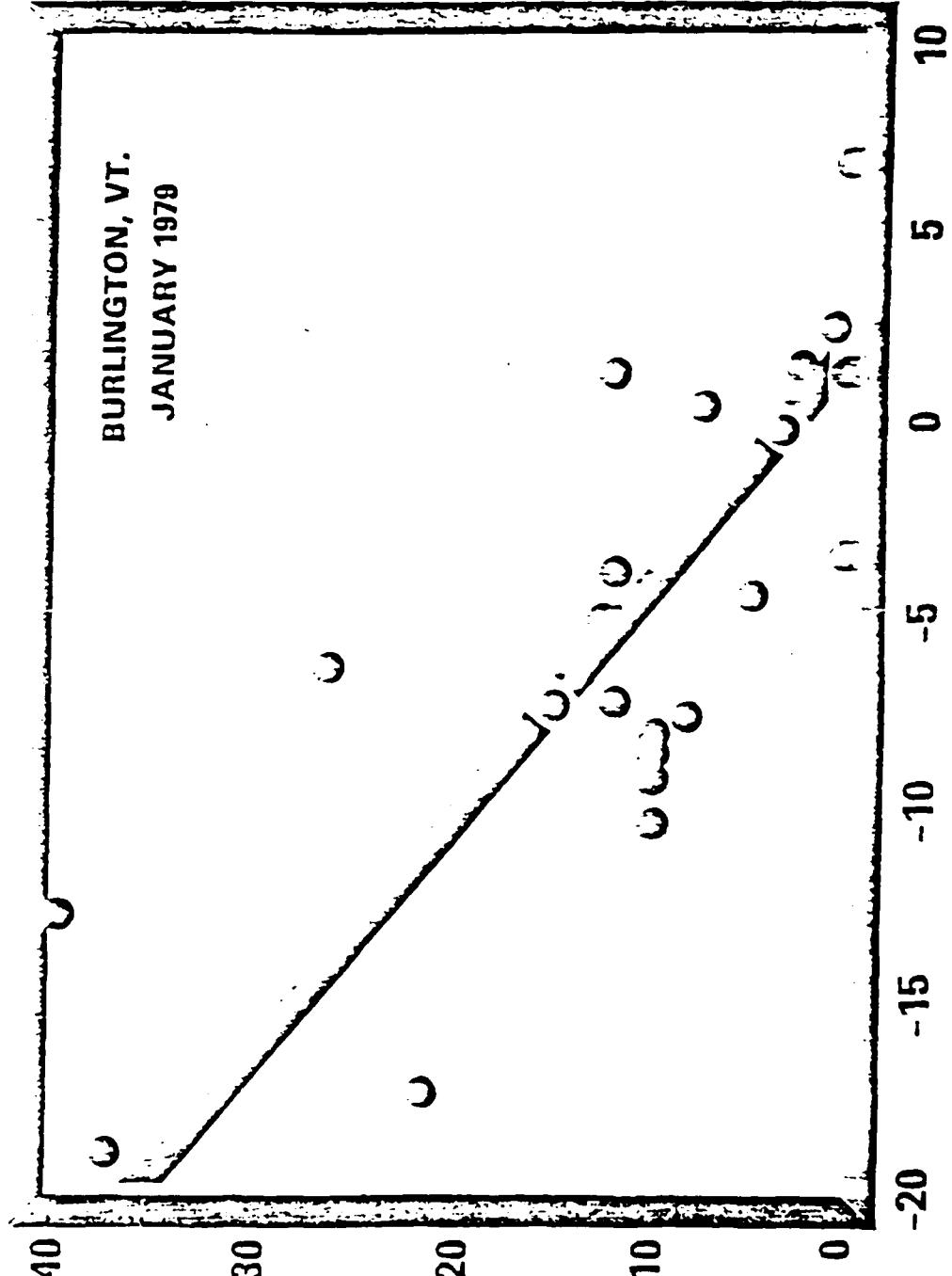


Accumulation Curves for snowfall (cont'd.)
and conversion factors for equivalent
Burlington, Vt., Jan. 1979



Comparison of observed 24-hour snowfall
Amounts vs. corresponding water equivalents

F-12



AVERAGE DAILY AIR TEMPERATURE

Relationship Between : a) 24 hour Ratio of
Snowfall to Water Equivalent and b) concurrent
Average Daily Air Temperature (°C) Burlington - Jan. 1979

RATIO OF: SNOWFALL/WATER EQUIV.

Local Climatological Data

Annual Summary With Comparative Data

1978

BURLINGTON, VERMONT



Narrative Climatological Summary

APR 30 1979

Burlington is located on the eastern shore of Lake Champlain at the widest part of the lake. About 35 miles to the west lie the highest peaks of the Adirondacks, while the foothills of the Green Mountains begin 10 miles to the east and southeast.

Its northerly latitude assures the variety and vigor of a true New England climate, while thanks to the modifying influence of the Lake, the many rapid and marked weather changes are tempered in severity. Due to its location in the path of the St. Lawrence Valley storm track and the Lake effects, the city is one of the cloudiest in the United States.

Lake Champlain exercises a tempering influence on the local temperature, during the winter months temperatures along the lake shore often run from 5 to 10 degrees warmer than at the airport 3 1/2 miles inland. At the airport the average date of the last freeze in spring is May 10 and that of the first in fall is October 3, giving a mean growing season from freeze to freeze of 145 days. This section is justly proud of its delightful summer weather. On an average there are only four days a year with maxima of 90° or higher. This moderate summer heat gives way to a cooler but none the less pleasant fall period, usually extending well into October. High pressure systems moving down rapidly from Central Canada or Hudson Bay produce the coldest temperatures during the winter months, but extended periods of very cold weather are rare.

Precipitation, although generally plentiful and well distributed throughout the year, is less in the Champlain Valley than in other areas of Vermont due to the shielding effect of the mountain barriers to the east and west. The heaviest rainfall usually occurs during summer thunderstorms but excessively heavy rainfall is quite uncommon. The rainfall during the historic flood of November 1927 was the heaviest on record. Droughts are of infrequent occurrence.

Because of the trend of the Champlain Valley between the Adirondack and Green Mountain ranges, most winds have a northerly or southerly component. The prevailing direction most of the year is from the south. Winds of damaging force are very uncommon, the most destructive occurring during the hurricane of October 1954 and the whole gales of November 1950.

Smoke pollution is nearly non-existent since there is no concentration of heavy industry here; however, haze has been on the increase during the last decade due to the large increase in industry to the north and south. During the spring and fall months, fog occasionally forms along the Winooski River to the north and east and may drift over the airport with favorable winds. In spite of the high percentage of cloudiness, periods of low aircraft ceilings and visibilities are usually of short duration, allowing this area to have one of the highest percentages of flying weather in New England.

noaa

NATIONAL OCEANIC AND
ATMOSPHERIC ADMINISTRATION

/ ENVIRONMENTAL DATA AND
INFORMATION SERVICE

/ NATIONAL CLIMATIC CENTER
ASHEVILLE, N.C.

F-1F

Meteorological Data For The Current Year

1

Normals, Means, And Extremes

years and extremes above are from existing and comparable sources. Annual extremes have been exceeded at other sites in the locality as follows: Miniau monthly precipitation 0.15 in October 1928; maximum precipitation in 24 hours 4.49 in November 1928; rainfall snowfall in 24 hours 2.1 in January 1918.

(a) Length of record, years, through the current year unless otherwise noted.
Begins on January date _____.

Materials - Based on record for the 1941-1970 period.
DATE OF AN INFLATE - The most recent in case of multiple

1941-1970 period.

卷之三

through 116°
lens of degrees clockwise

卷之四

Average Temperature

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1939	18.4	17.3	16.2	15.1	13.9	12.3	10.8	9.8	8.8	7.8	6.8	5.8	91.3
1940	11.8	11.2	10.2	9.2	8.0	6.8	6.8	8.8	10.2	11.8	13.2	14.8	87.3
1941	13.8	20.0	23.6	26.1	29.8	30.1	29.8	26.8	20.1	17.2	13.8	10.8	260.8
1942	17.4	19.9	21.6	23.2	25.2	26.1	26.1	25.8	25.2	24.8	23.8	21.8	261.8
1943	13.2	17.0	21.9	24.8	26.2	27.2	26.8	27.2	24.6	21.7	19.3	16.1	261.1
1944	20.8	19.0	17.0	15.7	13.1	10.8	7.8	4.8	2.8	1.8	1.8	1.8	261.1
1945	14.0	20.7	23.6	24.6	25.6	25.2	25.2	25.2	25.2	25.2	25.2	25.2	261.2
1946	19.8	19.0	18.8	18.6	18.4	18.2	18.0	17.8	17.6	17.4	17.2	17.0	261.0
1947	20.6	19.8	18.8	18.6	18.4	18.2	18.0	17.8	17.6	17.4	17.2	17.0	261.0
1948	17.8	20.0	22.8	24.8	25.2	25.8	26.1	26.1	25.8	25.2	24.8	24.2	260.2
1949	23.0	21.0	19.2	17.1	15.1	13.1	11.1	9.1	7.0	4.8	3.2	2.2	260.7
1950	17.0	20.0	22.0	24.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	260.0
1951	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	260.8
1952	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	260.2
1953	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	260.0
1954	17.0	21.1	23.8	25.4	26.1	26.5	26.8	27.1	27.4	27.8	28.2	28.6	260.6
1955	16.8	20.8	23.8	25.4	26.1	26.8	27.1	27.4	27.7	28.0	28.4	28.8	260.8
1956	19.0	21.0	23.0	24.6	25.3	25.8	26.1	26.4	26.7	27.0	27.4	27.8	260.8
1957	11.7	20.1	21.8	23.4	25.4	26.2	26.8	27.4	28.0	28.6	29.2	29.8	260.8
1958	16.8	20.0	22.0	23.8	25.1	26.1	26.8	27.4	28.0	28.6	29.2	29.8	260.8
1959	17.0	20.8	23.0	24.6	25.4	26.1	26.8	27.4	28.0	28.6	29.2	29.8	260.8
1960	16.8	20.0	22.0	23.8	25.1	26.1	26.8	27.4	28.0	28.6	29.2	29.8	260.8
1961	17.0	20.8	23.0	24.6	25.4	26.1	26.8	27.4	28.0	28.6	29.2	29.8	260.8
1962	17.0	20.8	23.0	24.6	25.4	26.1	26.8	27.4	28.0	28.6	29.2	29.8	260.8
1963	17.0	20.8	23.0	24.6	25.4	26.1	26.8	27.4	28.0	28.6	29.2	29.8	260.8
1964	17.0	20.8	23.0	24.6	25.4	26.1	26.8	27.4	28.0	28.6	29.2	29.8	260.8
1965	17.0	20.8	23.0	24.6	25.4	26.1	26.8	27.4	28.0	28.6	29.2	29.8	260.8
1966	17.0	20.8	23.0	24.6	25.4	26.1	26.8	27.4	28.0	28.6	29.2	29.8	260.8
1967	17.0	20.8	23.0	24.6	25.4	26.1	26.8	27.4	28.0	28.6	29.2	29.8	260.8
1968	17.0	20.8	23.0	24.6	25.4	26.1	26.8	27.4	28.0	28.6	29.2	29.8	260.8
1969	17.0	20.8	23.0	24.6	25.4	26.1	26.8	27.4	28.0	28.6	29.2	29.8	260.8
1970	17.0	20.8	23.0	24.6	25.4	26.1	26.8	27.4	28.0	28.6	29.2	29.8	260.8
1971	17.0	20.8	23.0	24.6	25.4	26.1	26.8	27.4	28.0	28.6	29.2	29.8	260.8
1972	17.0	20.8	23.0	24.6	25.4	26.1	26.8	27.4	28.0	28.6	29.2	29.8	260.8
1973	17.0	20.8	23.0	24.6	25.4	26.1	26.8	27.4	28.0	28.6	29.2	29.8	260.8
1974	17.0	20.8	23.0	24.6	25.4	26.1	26.8	27.4	28.0	28.6	29.2	29.8	260.8
1975	17.0	20.8	23.0	24.6	25.4	26.1	26.8	27.4	28.0	28.6	29.2	29.8	260.8
1976	17.0	20.8	23.0	24.6	25.4	26.1	26.8	27.4	28.0	28.6	29.2	29.8	260.8
1977	17.0	20.8	23.0	24.6	25.4	26.1	26.8	27.4	28.0	28.6	29.2	29.8	260.8
1978	17.0	20.8	23.0	24.6	25.4	26.1	26.8	27.4	28.0	28.6	29.2	29.8	260.8
MEAN	17.4	18.6	20.4	22.6	23.8	24.6	25.1	25.6	26.1	26.6	27.1	27.6	260.6
SD	2.6	2.7	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	260.6
MIN	9.2	9.6	11.3	13.6	15.1	16.2	17.0	17.8	18.6	19.4	20.0	20.6	259.3
MAX	21.0	22.0	23.0	24.0	25.0	25.8	26.3	26.8	27.3	27.8	28.3	28.8	260.8
RECD/ADJ	17.4	18.6	20.4	22.6	23.8	24.6	25.1	25.6	26.1	26.6	27.1	27.6	260.6

Heating Degree Days

Season	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Total
1949-50	20	21	174	200	180	168	158	145	125	96	40	8	619
1950-51	51	52	171	202	187	168	158	145	125	96	40	147	739
1951-52	20	21	174	202	187	168	158	145	125	96	40	147	739
1952-53	20	21	174	202	187	168	158	145	125	96	40	147	739
1953-54	71	54	279	271	207	186	161	141	121	101	71	24	739
1954-55	30	11	241	241	207	186	161	141	121	101	71	24	739
1955-56	32	134	227	177	179	151	131	111	91	71	52	107	624
1956-57	41	244	200	177	179	151	131	111	91	71	52	107	624
1957-58	42	239	200	177	179	151	131	111	91	71	52	107	624
1958-59	42	239	200	177	179	151	131	111	91	71	52	107	624
1959-60	42	239	200	177	179	151	131	111	91	71	52	107	624
1960-61	42	239	200	177	179	151	131	111	91	71	52	107	624
1961-62	42	239	200	177	179	151	131	111	91	71	52	107	624
1962-63	42	239	200	177	179	151	131	111	91	71	52	107	624
1963-64	42	239	200	177	179	151	131	111	91	71	52	107	624
1964-65	42	239	200	177	179	151	131	111	91	71	52	107	624
1965-66	42	239	200	177	179	151	131	111	91	71	52	107	624
1966-67	42	239	200	177	179	151	131	111	91	71	52	107	624
1967-68	42	239	200	177	179	151	131	111	91	71	52	107	624
1968-69	42	239	200	177	179	151	131	111	91	71	52	107	624
1969-70	42	239	200	177	179	151	131	111	91	71	52	107	624
1970-71	42	239	200	177	179	151	131	111	91	71	52	107	624
1971-72	42	239	200	177	179	151	131	111	91	71	52	107	624
1972-73	42	239	200	177	179	151	131	111	91	71	52	107	624
1973-74	42	239	200	177	179	151	131	111	91	71	52	107	624
1974-75	42	239	200	177	179	151	131	111	91	71	52	107	624
1975-76	42	239	200	177	179	151	131	111	91	71	52	107	624
1976-77	42	239	200	177	179	151	131	111	91	71	52	107	624
1977-78	42	239	200	177	179	151	131	111	91	71	52	107	624
1978-79	42	239	200	177	179	151	131	111	91	71	52	107	624
1979-80	42	239	200	177	179	151	131	111	91	71	52	107	624
1980-81	42	239	200	177	179	151	131	111	91	71	52	107	624
1981-82	42	239	200	177	179	151	131	111	91	71	52	107	624
1982-83	42	239	200	177	179	151	131	111	91	71	52	107	624
1983-84	42	239	200	177	179	151	131	111	91	71	52	107	624
1984-85	42	239	200	177	179	151	131	111	91	71	52	107	624
1985-86	42	239	200	177	179	151	131	111	91	71	52	107	624
1986-87	42	239	200	177	179	151	131	111	91	71	52	107	624
1987-88	42	239	200	177	179	151	131	111	91	71	52	107	624
1988-89	42	239	200	177	179								

MM-BB-1973

NATIONAL WEATHER SERVICE
INTERNATIONAL AIRPORT

Local Climatological Data



JNUHK 19/9

BURLINGTON, VERMONT

LATITUDE		49° 20' N		LONGITUDE		73° 00' W		ELEVATION (FEET)		332 FT.		STANDARD TIME USED		EST. EASTERN		WDM 014742		NOTES															
TEMPERATURE °F				DEGREES DEVIATION FROM MEAN				WEATHER TYPES				IN.		PRECIPITATION		AVG. STATION		WIND				SUMMARY		SAY COVER									
DATE		MEAN		MINIMUM		DEPARTURE		RELATIVE		DEVIATION		DEVIATION		DEVIATION		IN.		MM.		HR.		DIR.		FASTEST		MILES		PERIOD					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				
1	50	37	4	14.48	26	40	21	0	1	2	22	29.93	17	17.4	17.5	26	S	0	0	10	10												
2	51	22	23	1.37	19	34	20	0	2	4	6	0.00	4	0.0	0.0	22	NW	0	0	10	10												
3	52	0	-10	-2	6	49	0	0	2	4	6	0.00	0	0.0	0.0	20	NW	142	27	7	8												
4	53	7	-11	-7	-1	54	0	0	2	4	6	0.00	0	0.0	0.0	24	NW	193	36	6	7												
5	54	11	-14	-4	-2	51	0	0	2	4	6	0.00	0	0.0	0.0	18	NE	262	48	4	6												
6	55	12	-17	-1	6	46	0	0	2	4	6	0.00	0	0.0	0.0	17	SE	370	10	8	7												
7	56	11	-18	0	14	47	0	1	0	2	4	0.00	0	0.0	0.0	14	SE	44	0	0	0												
8	57	17	-21	4	16	44	0	1	0	2	4	0.00	0	0.0	0.0	11	SE	80	11	10	10												
9	58	10	-19	-2	7	50	0	0	0	2	4	0.00	0	0.0	0.0	10	SE	440	81	4	7												
10	59	3	-19	-6	-2	55	0	0	0	2	4	0.00	0	0.0	0.0	9	SE	329	80	7	8												
11	60	-15	-16	-23	-19	51	0	0	0	2	4	0.00	0	0.0	0.0	8	SE	476	88	0	3												
12	61	-16	-19	-2	-19	67	0	0	0	2	4	0.00	0	0.0	0.0	7	SE	412	79	8	6												
13	62	12	1.19	2	13	46	0	0	0	2	4	0.00	0	0.0	0.0	6	SE	0	0	10	10												
14	63	16	1.326	0	23	39	0	1	6	0	0	0.00	0	0.0	0.0	5	SE	380	71	5	6												
15	64	17	0.113	-4	-2	52	0	0	0	2	4	0.00	0	0.0	0.0	4	SE	207	37	10	10												
16	65	0	0.03	-4	-2	52	0	0	0	2	4	0.00	0	0.0	0.0	3	SE	207	37	10	10												
17	66	10	-1.1	-16	-3	64	0	0	0	2	4	0.00	0	0.0	0.0	2	SE	307	7	6	6												
18	67	-4	-7	-4.2	-19	7	0	0	0	2	4	0.00	0	0.0	0.0	1	SE	610	20	8	7												
19	68	3	-15	-1.6	-22	18	0	0	0	2	4	0.00	0	0.0	0.0	0	SE	516	82	4	4												
20	69	10	-1.4	-12	-8	61	0	0	0	2	4	0.00	0	0.0	0.0	0	SE	127	23	10	10												
21	70	16	-1.24	0	21	41	0	1	4	6	0	0.00	0	0.0	0.0	0	SE	0	0	0	0												
22	71	21	-1.23	7	17	42	0	1	6	0	0	0.00	0	0.0	0.0	0	SE	124	22	10	10												
23	72	26	-1.17	1	12	48	0	0	0	2	4	0.00	0	0.0	0.0	0	SE	436	77	4	4												
24	73	9	0.23	2	16	42	0	0	0	2	4	0.00	0	0.0	0.0	0	SE	0	0	0	0												
25	74	32	-1.05	19	23	30	0	1	0	2	4	0.00	0	0.0	0.0	0	SE	0	0	10	10												
26	75	31	-0.03	17	26	32	0	1	0	2	4	0.00	0	0.0	0.0	0	SE	0	0	8	8												
27	76	33	-1.35	19	26	30	0	1	0	2	4	0.00	0	0.0	0.0	0	SE	0	0	10	10												
28	77	34	-1.35	19	31	30	0	2	0	2	4	0.00	0	0.0	0.0	0	SE	0	0	10	10												
29	78	20	0.32	16	26	33	0	1	0	2	4	0.00	0	0.0	0.0	0	SE	0	0	10	10												
30	79	21	1.05	9	15	40	0	0	0	2	4	0.00	0	0.0	0.0	0	SE	0	0	10	10												
31	80	19	-1.18	3	12	46	0	0	0	2	4	0.00	0	0.0	0.0	0	SE	0	0	10	10												
32	81	50										10161	10161					10161	10161														
33	82	1462	D									4.50	27.8	29.56	28	7	8.2	29	NW	4660	100	256	253										
34	83	400	Avg	Def	Hdg	Def	Def					Precipitation								Date	Cd-2												
35	84	24	1.16	1.03	1.2	1.1	0.42	0	0	0	2	2.76									17250	27	8.3	8.7									
36	85	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
37	86	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
38	87	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
39	88	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
40	89	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
41	90	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
42	91	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
43	92	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
44	93	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
45	94	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
46	95	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
47	96	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
48	97	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
49	98	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
50	99	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
51	100	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
52	101	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
53	102	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
54	103	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
55	104	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
56	105	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
57	106	1.05	1.03	1.03	1.03	1.03	1.03	0	0	0	2																						
58	107	1.05	1																														

• EXTREME FOG (THE SOUTH) - LAST OCCURRENCE 1
- NOVEMBER 1961
• HEAVY SNOW
• 10-15% OF THE PREVIOUS DECADE'S DECEMBER
HEAVY SNOW - VISIBILITY ONE MILE OR LESS
• 10-15% OF THE PREVIOUS DECADE'S DECEMBER
HEAVY SNOW - VISIBILITY ONE MILE OR LESS
• 10-15% OF THE PREVIOUS DECADE'S DECEMBER
HEAVY SNOW - VISIBILITY ONE MILE OR LESS

MORE OBSERVATIONS PER DAY AT 3-HOUR INTERVALS.
FASTEST WIND AND SPEEDS ARE FASTEST OBSERVED.
ONE MINUTE VOLTS WITH DIRECTIONS ARE IN TERMS OF DEGREES. THE + WITH THE DIRECTION INDICATES
PARK GUST SPEED.
ANY READINGS DEFECTED WILL BE CORRECTED AND
CHANGES IN SUMMER DATA WILL BE ANNOUNCED IN
LATER EDITIONS.

SUMMARY BY HOURS												
HOUR	LEAD TIME	SET TIME	STATION	PERSONNEL	AVERAGES				RESULTS			
					TEMPERATURE				MATERIAL			
					HR. 45	HR. 46	HR. 47	HR. 48	MATERIAL 1	MATERIAL 2	MIN. SPEED	N.P.M.
					HR.	HR.	HR.	HR.	HR.	HR.	HR.	HR.
01:		61	29.57	181	181	181	181	181	71	71	9.3	13
04:		61	29.57	171	171	171	171	171	73	6.5	26	1
07:		61	29.59	181	181	181	181	181	72	71	9.1	12
10:		61	29.59	181	181	181	181	181	71	6.5	03	1
13:		61	29.59	211	191	191	191	191	67	10	9.9	23
16:		61	29.59	221	201	201	201	201	68	10.5	14	1
19:		61	29.59	201	181	181	181	181	70	9.1	30	1
22:		61	29.49	181	171	171	171	171	70	9.1	21	1

QUOTE FROM PAPER: "I DON'T THINK IT'S POSSIBLE TO GET A BETTER DEAL THAN THE ONE WE GOT. I DON'T THINK ANYONE IS GOING TO GET A BETTER DEAL THAN THE ONE WE GOT." - DEPARTMENT OF COMMERCE, APRIL 1994

RECORDED AND INDEXED IN THE RECORDS OF THE BUREAU OF LAND MANAGEMENT, AND IS CORRELATED WITH RECORDS OF THE STATE OF WASHINGTON.

Daniel D. Wicke

END

FILMED

4-85

DTIC

